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SOME ARAGONESE MORPHOPHONEMICS

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ABSTRACT

The stress patterns of Aragonese are examined within the framework of generative phonology, based on data taken from the traditional works of Haensch, Badía Margarit, and Alvar Lopez. Stress placement is shown to be regular. Two sets of rules which account for the data are compared. In the preferred solution, a penultimate stress rule, a rule of stress shift, and other independently motivated rules account for the various stress patterns in Aragonese. Dialectical differences in stress placement are shown to result from rule reordering.

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0. Word stress patterns have been studied very little in Aragonese.[2] The present study can only hope to be exploratory at most since little prior research has been done. Nevertheless, the results of this research generally should provide a firm basis for future and more comprehensive work.

The purpose of this study will be to establish that stress in Aragonese is a completely predictable phenomenon. This will be shown by postulating a stress rule that will, along with functionally related rules and proper base forms, account for the various stress patterns of Aragonese. In addition, it will be shown that those differences in stress that do exist between dialects in Aragonese are apparent only and attributable to the "functionally related rules."[3]

1. Consider the following list which exhibits the numerically dominant word stress pattern of substantives in Aragonese.[4]

Chart Ia[5]

ĉíβa	'hunchback'
trípa	'entrails'
bárβa	'chin'
barrílλa	'jaw'
kanyélλa	'wrist'
pyérna	'thigh'
béna	'esophagus'
kára	'face'
kása	'house'
kaβésa	'head'
entráóa	'vestibule'
fórka	'fork'
kwaránta	'forty'
féβre	'fever'
λáóre	'thieving'
kwátre	'four'
ĉeláγra	'furze'
asúkre	'sugar'
bináγre	'vinegar'
kaβéstre	'butt'
amórro	'sow'

múskʌo	'shoulder'
bráso	'arm'
díδo	'finger'
melíγo	'navel'
galíʌo	'Adam's apple'
barránko	'gully'
fílo	'thread'
seδáso	'sieve'
taβáno	'horsefly'
paníso	'corn'
déδo	'finger'
melíko	'navel'
paníθo	'corn'
estomáγo	'stomach'
musíka	'music'
molomáγa	'type of plant'
caδyéra	'bench'
kantáro	'pitcher'
etc.	

Verbs also exhibit this pattern.

Chart Ib

tóryo	'I twist'
twérsko	'I twist'
párte	'He divides'
sáka	'He takes out'
etc.	

As can be seen from the above lists of lexemes the predominant word stress pattern in Aragonese is penultimate. The following rule would account for this pattern.

(1) Main Stress Rule

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \;/\; ___\; C_o\, V\#^{6}$$

(where "C" is equal to the feature complex [-Syllabic] and "V" is [+Syllabic])

There is a fairly large group of lexemes, however, which exhibit ultimate stress.

Chart IIa

señál	'sign'
kapón	'capon'
baθyól	'drinking trough'
biɣós	'farming instrument'
braɣér	'joint of the udder of a cow'
brikét	'lighter'
burlonót	'joking'
kahíe	'nominal measure of twelve bushels'
kalór	'heat'
etc.	

This pattern is also found in verb forms.

Chart IIb

responém	'We respond'
kayér	'to fall'
kuʎír	'to gather'
arriér	'to laugh'
kantár	'to sing'
etc.	

To account for the above stress pattern one might propose that rule (1) be revised to (2).

(2) [+Syllabic] → [+Stress] / ____ C_1 (V)#

Notice that (2) breaks down into two subrules which are disjunctively ordered. This is displayed in (3) which is a graphic illustration of (2).

(3) [+Syllabic] → [+Stress] / ____ $\left\{\begin{matrix} C_1 \ V \ \# & 1) \\ C_1 \ \# & 2) \end{matrix}\right\}$

Condition: If number one applies, then two does not apply (disjunctive condition).

Subrule one then accounts for the lexemes of which the ones in Chart I are representative, and subrule two accounts for the lexemes of which the ones in Chart II are exemplary. However, by looking a little further we will see that (2) will not do.

Chart III

enimíɣos	'enemies'
kaðyéras	'benches'
meðíkos	'doctors'
makínas	'machines'
etc.	

By rule (2) these forms would be improperly accented as "'enimiɣós, 'kaðierás, 'meðikós" etc. Obviously another solution must be found because this will not do. We might propose that rule (2) be revised to that of (4).

$$(4) \quad [+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; ____ \; C_1 \; (V \; (\begin{bmatrix} +\text{CNS} \\ \{+\text{Plural}\} \end{bmatrix})) \; \#$$

(4) has three subrules which are disjunctively ordered. These are illustrated in (5).

$$(5) \quad [+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; ____ \begin{cases} C_1 \; V \begin{bmatrix} +\text{CNS} \\ \{+\text{Plural}\} \end{bmatrix} \# & 1) \\ C_1 \; V \; \# & 2) \\ C_1 \; \# & 3) \end{cases}$$

Condition: One through three are disjunctively ordered.

Once again a revised but much more complex rule accounts for the data. Subrule one will properly stress the lexemes of Chart III and the group they represent. Subrules two and three will respectively account for Charts I and II. However, once again the addition of new data defies our stress rule because there is a group of lexemes in Aragonese that end in consonants, take penultimate stress, and are not necessarily plurals.

Chart IV

myérθes	'Wednesday'
byérnes	'Friday'
tirapyéðras	'door knob'
ánĉel	'angel'
oréβal	'type of shrub'
árβol	'tree'
núβel	'storm cloud'
barríλas	'jaw'
mokáðor	'handkerchief'[7]
etc.	

Subrule three of (5) would improperly stress "myerθes, anĉel, mokaδor" etc. as "myerθés, anĉél, mocadór" etc. Since these words are not plural, subrule one is inapplicable. Two is also inapplicable since they do not end in vowels. This leaves three which applies as it did in the cases of Chart II. However, these words have penultimate stress and not ultimate stress like the ones of Chart II. Notice that we cannot further elaborate rule (4), the stress rule, as was done in previous cases to handle the lexemes of Chart IV because they are canonically and grammatically identical to the lexemes of Chart II. Chart IV then constitutes as empirical falsification of rule (4). One solution to the problem would be to mark all the lexemes of which the ones of Chart IV are exemplary with an exception feature. Then rule (4) would be inapplicable to this set of lexemes. Another rule would then stress them properly (or alternatively they would be marked for stress in the base forms). Using an exception feature, however, would have the effect of creating a relatively large class of lexemes which for no other reason other than stress would be classed together. This does not come without cost because any arbitrary classification within a transformational grammar is costly under the simplicity metric and this is an example of arbitrary classification since it is only needed for one reason. In addition to this, if the exception feature is used the addition of another rule is needed and this constitutes further complication in the grammar. Obviously a proposal of this type[8] must be put aside until all possible phonological and grammatical ones have been studied and appraised.

Consider the lexemes of Chart I once again. To be observed is the fact that of the three vowels which occur in word final position in Aragonese ([e], [o], [a]) the front mid vowel has a limited distribution in that position. The only environment in which we find the front mid vowel is the one that follows consonant clusters, i.e. VCC ___ as in the words [féßre, λáδre, kuátre, binágre], etc. The mid vowel [e] is then lacking from the final environment which follows single consonants, i.e. VC ___#. Turning our attention now to Chart II where ultimate stress is displayed, we find that these words all end in a consonant that is immediately preceded by a vowel, i.e. VC#. This environment is then identical to the one in which we found "e" missing in Chart I, i.e. VC ___#. The fact of the matter is that if [e] were found in this environment it would be equal in distribution in final position to that of [o] and [a]. Also notice that if [e] were

found in this environment in the lexemes of Chart II they would have penultimate stress and not ultimate. The above observations seem to lead to the conclusion that there is an [e] in word final position in the lexemes of Chart II in the derivation at the time of stress which is deleted before the final phonetic form is derived. The presence of the [e] along with a vowel apocopation rule could explain on the one hand the ultimate stress pattern of the lexemes of Chart II and on the other hand the limited distribution of [e] in word final position. In addition to this it simplifies the stress rule to the form (6).

(6) [+Syllabic] → [+Stress] / ____ (C_oV) C_o#

(the second subrule will accent monosyllabic forms)

(6) will account for all the stress patterns exemplified in Charts I-IV if an [e] is present at the time of stress in the derivation in final position in the lexemes of Chart II. One way an [e] could be put into the derivation would be by a vowel epenthesis rule which would place the front mid vowel after word final VC sequences.

(7) Epenthesis Rule

Ø → e / VC ____ #

This rule would be ordered before (6), the stress rule, which would be followed by the vowel apocopation rule. Example one would be a sample derivation for this solution.

Example #1

/señal/	Underlying Form
|señale|	(7) Epenthesis Rule
|señále|	(6) Main Stress Rule
|señál|	Vowel Apocope
[señál]	Final Phonetic Form

This solution, however, has two defects. To begin with, while it accounts for stress, it does not account for the aberrent distribution of [e] in final position since [e] was epenthesized and not there to begin with. Secondly and more crucially, rule "b" will epenthesize [e] also after the final VC sequences of the lexemes of Chart IV. A lexeme from Chart IV would have a derivation like the following.

Example #2

/mokador/	Underlying Form
|mokadore|	(7) Epenthesis Rule
|mokadóre|	(6) Stress Rule
|mokadór|	Vowel Apocope
	(Other rules)
*[mokaðór]	Final Phonetic Form

Notice that the output of this derivation is an ungrammatical sequence because it is stressed improperly. Rule (7) cannot be made to distinguish between the lexemes of Chart II and the ones of Chart IV since they are phonologically, morphologically, and grammatically alike; therefore, it will create an ungrammatical sequence each time an underlying form for a lexeme of the type of Chart IV serves as an input. Once again exception features could be used to set off the lexemes of Chart IV; however, we reject them here for the same reasons stated above. Rule (7) is then rejected as a possible solution for this problem. Another possible solution is to assume that the front mid vowel is in the underlying form to begin with; that is, it is part of the underlying forms for the lexemes of Chart II but not part of the underlying forms for the lexemes of Chart IV. This solution like the first one would require a vowel apocopation rule which would delete these final front mid vowels when they followed a VC sequence. The following is a tentative approximation.

(8) Apocope Rule

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \\ -\text{Low} \end{bmatrix} \rightarrow \quad \emptyset \;/\; VC ____ \#$$

A sample derivation for two lexemes one from Chart II and the other from IV would look like the following.

Example #3

/kalore/ (form II)	/mokador/ (form IV)	Underlying Form
|kalóre|	|mokádor|	(6) Stress Rule
|kalór|	NA (nonapplicable)	(8) Vowel Apocope
		(Other rules)
[kalór]	[mokáðor]	Final Phonetic Form

This solution has the effect of explaining why some lexemes (the ones in Chart II as opposed to those of IV) which look alike canonically differ in stress phonetically. The explanation is in the fact that they differ in their underlying forms; that is, the ones of Chart II end in vowels and the ones of Chart IV, in consonants. This postulation besides accounting for apparent stress irregularities also explains the limited occurrence of [e] in final position; that is, [e] has the same distribution as [a] and [o] in the underlying forms, but undergoes an apocopation rule which deletes it from VC ____ # environments.

To sum up then, to account for the lexemes of Charts I-IV we have had to postulate final front mid vowels for the lexemes of Chart II, a penultimate stress rule, and a vowel apocopation rule. Therefore, we may think in terms of two rules so far: 1) a penultimate main stress rule and 2) a vowel apocope rule.[9]

The above hypothesis of final vowel postulation, will not account for all the irregularity of stress in Aragonese because there exists an additional group of lexemes which exhibit either antepenultimate or ultimate stress where final vowel postulation will not explain the stress irregularity.

Chart Va

sofráina	'curved'
káiša	'coffin'
bóira	'generic name of cloud'
maθéiša	'skein'
λéuta	'yeast'
táula	'board'
borráina	'borage'
fléišin	'ash tree'
baráiša	'pack of cards'
pyáina	'stand'
λešyú	'washing'
etc.	

The above list is representative of substantives with this type of stress pattern. Chart Vb shows participles from dialects C and E which exhibit it also.

Chart Vb

rompyú	'broken'
suβyú	'known'
sentyú	'felt'
benyú	'come'
kisyú	'wanted'
káito	'fallen'
etc.	

Chart Vc shows this same pattern occuring in verb conjugations.

Chart Vc

aβryés	'You opened'
aβryó	'He opened'
salyés	'You left'
salyón	'They left'
bendyé	'I sold'
bendyés	'You sold'
bendyó	'He sold'
káiβa	'I was falling'
tráiβa	'I was bringing'
etc.	

The question is this: do these words constitute true exceptions to the penultimate stress rule or are they only apparent exceptions. If the former is true then rule (6), the penultimate stress rule, is inadequate in its present form since it obviously will not handle the lexemes of V. To account for the above stress pattern as well as what we have accounted for so far, we propose the following reformulation of (6).

(9) [+Syllabic] → [+Stress] / ____ ((V) [+Consonant]$_1$ V) C_o#

This rule can be expanded into three disjunctively ordered subrules which are displayed in (10).

(10) [+Syllabic] → [+Stress] / ____ { V [+Consonant]$_1$ VC_o# 1) ; [+Consonant]$_1$ VC_o# 2) ; C_o# 3) }

Condition: One through three are disjunctively ordered.

Rule (9) along with the vowel postulations we have made will account for the stress patterns of Charts I-V in the following manner.

Example #4

Chart I	Chart II	Chart IV	Chart V	Chart V	
/ĉiba/	/kalore/	/mokador/	/benyu/	/kaitu/	Tentative Underlying Forms
(subrule 2)	(subrule 2)	(subrule 2)	(subrule 3)	(subrule 1)	Stress (9)
ˈĉíba|	|kalóre|	|mokádor|	|benyú|	|káitu|	
NA	|kalór|	NA	NA	NA	Apocope (8) (other rules)
[ĉíba]	[kalór]	[mokáδor]	[benyú]	[ˈkáitu]	Phonetic Forms

It appears then that (9) will handle the above exceptions to (6). However, looking further we find lexemes like the following.

Chart VIa

piλáu	'plundered'
kantáu	'surg'
payáu	'paid'
treβaλáu	'worked'
tornáu	'returned'
aleráu	'stupified'
fresáu	'frezar'
etc.	

Rule (9) will improperly accent the above past participles respectively as "*piλaú, *kantaú, *payaú," etc. Notice that these forms are grammatically parallel to the ones of Chart Vb in that both sets are masculine past participles. However, the participles of Chart VIa differ from those of Chart Vb in that the first vowel of a hiatus is stressed in the former and in the latter it is a final vowel which is the second member of a diphthong which is stressed. At first sight one might propose the following revision of rule (9) to handle the new data.

(11) [+Syllabic] → [+Stress] / ____ (((V)[+Consonant]$_1$)V)C$_o$#

The adequacy of this rule, however, is only apparent. Notice that in order for forms like [benyú] to be stressed correctly by rule (9) the glide has to block subrule two of (10). Since the glide [y] is [-Consonant] it will be excluded from being part of the consonant cluster. Therefore words with a final diphthong will not fit the structural description of subrule two (also one) which means that forms of this type will be stressed by subrule three which places stress on the final vowel. If this were the situation in all cases, that is, if all final diphthongs were stressed, then rule (11) would be acceptable; however, this is not the situation. Forms like [θékya, alúßya, alßerténθya, xólyo], etc. suggest that glides should be considered as part of the consonant clusters since the penultimate vowel is stressed (they undergo subrule two) and not the ultimate vowel which is part of the diphthong. Since we cannot both choose to allow and not to allow the glide to be part of the consonant cluster we must make a decision between the two choices. Not allowing glides to be part of consonant clusters according to our stress rule is tantamount to the claim that the glides of all final diphthongs take part in stress, but this is obviously not true since some clearly do not. It seems more reasonable to allow glides to be part of consonant clusters (permitting forms like [θékya] to be stressed by subrule two) and to claim underlying sylabicity for those glides which have apparently taken part in stress (thus still blocking subrule two from applying to the forms of charts Vb and c). To begin with, we must allow the 'consonant cluster' in question to include all nonsyllabics, not just those marked [+Consonant]. This is achieved by specifying it as [-Syllabic] instead of [+Consonant], i.e., it will now appear in the rule as $[-\text{Syllabic}]_1$ $(=C_1)$. Secondly, we must alter the input to the stress rule of forms like [benyú] in order that they not be penultimately stressed. The fact that these glides do take part in stress appears to be an indication that there is a history of syllabicity in their derivation; that is, they are vowels at the time stress applies. That this is the case is further substantiated by the additional fact that the glides which are in the final stressed diphthongs of the forms of Charts Vb and c are the phonetic realizations of what are traditionally considered to be the stem vowels of verbs. Consider the following forms in Chart VIb.

Chart VIb

benyú	'come' (participle)
byénes	'You come'
byéne	'He comes'
byénen	'They come'
benímos	'We come'
benído	'You (pl) come'

Where the underlined segment is the stem vowel.

(The last five forms are representative of all the verbs with respect to the syllabicity of the stem vowel.) Notice that the stem vowel is syllabic in all but the first form and has taken part in stress placement in each case. The last two forms in particular provide strong evidence in that they have actually received stress. This is then evidence for underlying syllabicity for the segments traditionally referred to as stem vowels since nonsyllabics do not take part in stress placement. This is once again shown by forms such as [θékya, alúßya, alßertéηθya, matrimónyo, endámyo], etc. where the glides are simply acting as part of the consonant clusters. Under any other interpretation there would be a great deal of complication. We then assume for the reasons stated above that segments usually referred to as stem vowels are syllabic in their underlying forms and later, after stress, are glided in certain environments. Note that the forms of Charts Vb and c plus the true glide forms, i.e.[θékya] are stressed properly by (9) now because, on the one hand, we respecified its internal 'consonant cluster' to include all nonsyllabics and, on the other hand, we assumed that all stem vowels were syllabic at the time of stress (thus the stem vowel, being [+Syllabic] at the time of stress, will block the application of subrule two of (10) as the glide did before). However, we still have not accounted for the stress of the forms in Chart VIa. One possible solution to this problem involves recognizing verb classes which have traditionally been referred to as conjugational classes. To begin with notice that the stems of the participles of Chart VIa have a different stem vowel than the ones of Chart Vb and c. We could set up a revised form of (9) which would stress the masculine participles of the "a" conjugation class (Chart VIa) differently than the rest of the masculine participles.

This seems to be very arbitrary, however, since the members of the "a" conjugation class differ in no other way with regards to stress from the other verbs. Therefore this would be placing a special restriction on the stress rule which would be applicable only for a small set of verb forms. The above involves a solution which is partially grammatical and phonological. There is, however, a purely phonological solution which will properly stress all the lexemes considered up to now. Keeping in mind that the first vowel of the hiatus was stressed if it was [a], otherwise the second vowel was stressed, consider rule (12). (Keep in mind that we are speaking of underlying hiatuses. Their phonetic reflexes may or may not be hiatuses.)

(12)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \begin{bmatrix} ____ \\ \langle +\text{Low} \rangle \end{bmatrix} \begin{Bmatrix} (V)\ C_1 V C_o \# & 1) \\ \langle V \rangle \quad C_o \# & 2) \end{Bmatrix}$$

(See Harms 1968 for explanation of angled brackets.)

Rule (12) can be expanded into (13).

(13)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \begin{Bmatrix} ____ \begin{Bmatrix} V\ C_1 V\ C_o\ \# \\ C_1 V\ C_o\ \# \end{Bmatrix} & 1) \\ \begin{bmatrix} \overline{+\text{Low}} \end{bmatrix} \quad V\ C_o\ \# & 3) \\ ____\ C_o\ \# & 4) \end{Bmatrix}$$

Condition: One through four are disjunctively ordered.

Notice that subrules one, two, and four were illustrated in Example #4 respectively as one, two, and three. Subrule three of (13) will properly stress the forms of Chart VIa.

Example #5

/trebaλau/	/kantau/	Tentative Underlying Forms
(Subrule 3)	(Subrule 3)	
|trebaλáu|	|kantáu|	Stress (Other rules)
[treβaλáu]	[kantáu]	Final Phonetic Form

However, by looking at more data we find that this rule is still inadequate in its present form. For example, consider the following data.

Chart VIIa

trayéis	'You bring (pl)'
beyéis	'You see (pl)'
séis	'You are (pl)'
kantéis	'You sang (pl)'
riδyóres	'You laughed'
saβyóres	'You knew'
salyóres	'You left'
partyémos	'We divided'
salyémos	'We left'
metyémos	'We put'

To begin with the latter six forms will require us to reformulate (12) because as it is formulated now it will improperly stress "ri iores, sa iores, saliores" etc. respectively as [ri íores, sa íores, salíores] etc. Secondly the first four forms will require a modificaiton of subrule three since "e" is not low. The latter is a minor modification; however, the former is not. Consider (14) as an initial approximation to this rule.

(14)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \;/\; \left\{ \begin{array}{ll} V \left[\frac{\quad}{-\text{High}}\right] C_1 V\, C_o\# & 1) \\ \left[\frac{\quad}{-\text{High}}\right] (V)\, C_1 V C_o\# & \\ \langle V \rangle\, C_o\# & 2) \end{array} \right\}$$

Condition: Subrules one and two are disjunctively ordered.

Rule (14) is very complicated though, in fact so complicated as to make one suspicious of it. Notice that we have disjunctively ordered subrules "one" and "two" with brace notation. However, good evidence has been presented by Chomsky and Halle showing that brace notation should only be used to conjunctively order rules and that parenthesis notation should be used to disjunctively order rules. That is, "two successive rules of the grammar are disjunctively ordered . . . if they can be jointly abbreviated by a schema involving parentheses . . .[if] they can

be abbreviated by the brace notation . . . they are conjunctively ordered." (Chomsky 1967:121) Accepting their conclusions as valid and it appears they are, then, we have improperly used the brace notation. That is, we have disjunctively ordered brace notation by the use of an ad hoc condition which stated that it was disjunctive in this particular setting. (14) is, then, an impossible rule within the theoretical model we are working since brace notation is ruled out as a possible abbreviatory device for disjunctive ordering. At this point it might be asked if (14) is revisable in terms of parenthesis notation. If it is not we must then sharply change our approach to the problem. To begin with, notice that in subrule "two" of (14) we have properly used brace notation; that is, its subrules are conjunctively ordered. However, observe that it can be made wholly disjunctive with the use of parenthesis notation. In addition to the above principles concerning conjunctive and disjunctive ordering, Chomsky and Halle have presented sound evidence for a principle which states that disjunctive ordering by the use of parenthesis notation and an extension of it, angled brace notation, should be maximally utilized in the grammar; that is, "abbreviatory notations must be selected in such a way as to maximize disjunctive ordering". (Chomsky and Halle 1968:63) In accordance with this principle we must prefer, then, the disjunctively ordered rule over the conjunctively ordered one. With this in mind, we propose (15) as the corresponding disjunctively ordered rule to (14).

(15)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \left\{ \begin{array}{ll} V \left[\overline{-\text{High}}\right] \; C_1 \; V \; C_0\# & 1) \\ \left[\overline{\langle -\text{High} \rangle}\right] \langle V \rangle \; (C_1 V) \; C_0\# & 2) \end{array} \right\}$$

Condition: Subrules one and two are disjunctively ordered.

Though this rule is an improvement over (14), it still violates the principles of transformational grammar; however, as should be obvious by now, subrule "two" can be ordered before subrule "one" and if it is, "one" becomes vacuous since "two" in its disjunctive formulation will handle all the stress patterns properly. With this being the case, subrule "one" is deleted from (15) giving us (16), a rule which is wholly disjunctive and completely in accordance with the principles of transformational grammar.

(16) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \left[\overline{\langle -\text{High} \rangle}\right] \; \langle V \rangle \; (C_1 V) \; C_o \; \#$

(16) can be expanded into (17).

(17) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \left\{ \begin{array}{lll} \left[\overline{-\text{High}}\right] \; V \; C_1 \; V \; C_o \; \# & & 1) \\ \left[\overline{-\text{High}}\right] \; V \; C_o \; \# & & 2) \\ \underline{\quad\quad} \; C_1 \; V \; C_o \; \# & & 3) \\ \underline{\quad\quad} \; C_o \; \# & & 4) \end{array} \right\}$

Condition: One through four are disjunctively ordered.

This disjunctive rule, however, is more general than (14) because it claims that the first vowel of any hiatus will be nonhigh if it is stressed. (14) on the other hand only claimed this for ultimate hiatuses. That the former is the case is shown by the following forms:

Chart VIIb

bóira	'generic name of cloud'
maǿéiša	'skein'
λéuta	'yeast'
θéika	'irrigation ditch'
fléišin	'ash tree'
léiβa	'I was reading'

This solution then seems to lend some credence to the claim that disjunctive ordering must be utilized to the maximal extent.

Consider now the following forms.

Chart VIIc

rekúina	'pantry'
múito	'much'
búišo	'box'
frúita	'fruit'
búitre	'vulture'
búina	'cow dung'
brúiša	'witch'

The above forms would be stressed improperly by our stress rule. That is, "muito, buĩso, fruita" would be stressed respectively as *[muíto, buíso, fruíta]. The reason for this improper stressing is because our role will not stress the first vowel of a hiatus unless it is nonhigh which of course [u] is not. To remedy this we propose (18).

(18)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left[< \left\{ \begin{matrix} \overline{+\text{Back}} \\ -\text{High} \end{matrix} \right\} > \right] __ V \; (C_1 V) \; C_o \#$$

(18) states that the first vowel of a hiatus is stressed if it is either [+Back] or [-High]. Under this formulation then the above forms well be stressed properly.

By now it should be becoming obvious that there is more going on here than (16) is stating. That this is true is pointed up by the following forms.

Chart VIId

ĉoán	'proper name'
toáʎa	'tovalla'
bomboneá	'to buzz'
esplɔβisñoñeá	'to drizzle'
raskleár	'to work with pearls'
trakeár	'to throb, beat with regard to the heart' (palpitate)

Notice that in each case the stress rule as now formulated would stress the first vowel of each hiatus since in every form they are nonhigh and in some of them they are even back. (18) must then be reformulated to (19).

(19)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left[< \left\{ \begin{matrix} \overline{+\text{Back}} \\ -\text{High} \end{matrix} \right\} > \right] < \left[\begin{matrix} +\text{Syllabic} \\ -\text{Low} \end{matrix} \right] > (C_1 V) \; C_o \#$$

That is, we must know not only some of the point features of the first vowel but also some of the second. (19) states that in order for the first vowel of a hiatus to be stressed, the second vowel must be nonlow and the first either back or nonhigh. It can be expanded as follows.

(20)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \begin{cases} \left[\frac{\quad}{+\text{Back}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_1V \; C_o\# & \text{a} & 1) \\ \left[\frac{\quad}{-\text{High}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_1V \; C_o\# & \text{b} & \\ \left[\frac{\quad}{+\text{Back}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_o\# & \text{a} & 2) \\ \left[\frac{\quad}{-\text{High}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_o\# & \text{b} & \\ \underline{\quad} \; C_1V \; C_o & & 3) \\ \underline{\quad} \; C_o & & 4) \end{cases}$$

Rules one through four are disjunctively ordered while the "a" and "b" subparts of subrules one and two are conjunctively ordered, with respect to each other.

We illustrate rule (19) in example #6.

Example #6.

/kantua/	/kanteis/	/metiemos/	/muito/	/raskleare/	Underlying Forms
(by 2a	(by 2a)	(by 3)	(by 1a)	(by 3)	Main Stress Rule
¦kantáu¦	¦kantéis¦	¦metiémos¦	¦múito¦	¦raskleáre¦	A-12II
NA	NA	NA	NA	¦raskleár¦	Apocope C$_o$ (other rules)
[kantáu]	[kantéis]	[metyémos]	[múito]	[raskleár]	Final Phonetic Form

It appears as if rule (19) accounts for the data, however, as it might have been observed already, this is not quite the case because of forms like the third one in example #6, [metyémos]. To put this in perspective, let us consider the following preterite constructions which are representative of various verb paradigms in the control dialects (forms similar to these can be found in the western dialects, but not in the eastern dialects which lack a preterite tense; however the latter in no way invalidates the conclusions which will be reached here.

Chart VIIIa

metyé	'I put'
metyóres	'You put'
metyó	'He put'
metyémos	'We put'
metyée	'You put (plural)'

metyóren	'They put'
koθyé	'I cooked'
koθyóres	'You cooked'
koθyó	'He cooked'
koθyémos	'We cooked'
koθyéθ	'You cooked (plural)'
koθyóren	'They cooked'
poδyé	'I was able'
poδóres	'You were able'
poδyó	'He was able'
poδyémos	'We were able'
poδyéθ	'You were able (plural)'
poδyóren	'They were able'

The stem vowels which are phonetically realized as glides in the above forms earlier were shown to be syllabic in their underlying representation. Furthermore, it was assumed without justification that they were high front unrounded vowels (i.e. the vowel /i/); however, this is not the case. In fact, we will have to consider them /e/ in their underlying representation because of their corresponding indicative forms.

Chart VIIIb

métes	'You put'
méte	'He puts'
metémos	'We put'
metéθ	'You put (plural)'
méten	'They put'
kwéθes	'You cook'
kwéθe	'He cooks'
koθémos	'We cook'
koθéθ	'You cook (plural)'
kwéθen	'They cook'
pwéδes	'You are able'
pwéde	'He is able'
poδémos	'We are able'
poδéθ	'You are able (plural)'
pwéδen	'They are able'

In the above forms [e] is the phonetic realization for the stem vowel of the same verbs shown in Chart VIIIa. If the above were the only pertinent data, then we would have an arbitrary choice between either "i" or "e" as the underlying representation of the stem vowel. However, that "e" must be chosen is shown by the following additional data where we do have [e]'s being derived from stem vowels which have as their underlying representation /i/.

Chart IXa

pártes	'You divide'
párte	'He divides'
partímos	'We divide'
partíθ	'You divide (plural)'
párten	'They divide'
partíβe	'I was dividing'
partíβas	'You were dividing'
partíβa	'He was dividing'
dwérmes	'You sleep'
dwérme	'He sleeps'
dormímos	'We sleep'
dormíθ	'You sleep (plural)'
dwérmen	'They sleep'
dormíβe	'I was sleeping'
dormíβas	'You were sleeping'
dormíβa	'He was sleeping'

There is an obvious morphophonemic alternation in the above chart between [i] and [e] as the phonetic realization of the stem vowel which is predictable in terms of stress, that is, [i] is realized when stress is present and [e] when it is not. If we assume that [i] is the correct underlying representation, then the following simple rule will account for this morphophonemic alternation.

(21) Vowel Lowering

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \end{bmatrix} \rightarrow [-\text{High}] \; / \; \begin{bmatrix} _____ \\ -\text{Stress} \end{bmatrix}$$

If /i/ is the correct underlying representation of the stem vowel for the forms of Chart IXa, then we will have to consider the stem vowels of Charts VIIIa and VIIIb as being /e/ in their underlying representations since they do not alternate with respect to stress as the above forms do. Notice that we cannot consider the stem vowels of Chart IXa to be /e/ and derive /i/ from it when under stress because this would force us into representing the stem vowels of Charts VIIIa and VIIIb as /i/ which would result in circularity. For example, the above solution would involve at least two rules, one which would raise [e]'s to [i]'s under stress (partémos → partímos) and one which would lower [i]'s to [e]'s when not followed by a vowel (kwéθi → kwéθe). If we order the first rule before the second, we get ungrammatical derivations like the following: |partémos| → |partímos| → *[partémos]. On the other hand, if we consider the second rule ordered before the first, we still get ungrammatical derivations: |koθímos| → |koθémos| →*[koθímos]. It would require simultaneous application for the above two rules to apply properly in the grammar. However, simultaneous application for rules such as those above has been rejected by generative phonologists on various occasions, i.e. Chomsky and Halle 1968, Postal 1968. They have shown rather conclusively that it leads to great complication in the grammar and, in addition, results in "no significant generalizations". With simultaneous application not a possibility we are left with our first proposal to work out, which is, that the stem vowels of Charts VIIIa and VIIIb are represented morphophonemically as /e/ and the ones of Chart IXa as /i/. We have already accounted for the morphonemic alternation in Chart IXa; however, we must still acount for forms of the first three verbs like [metyé, metyó, koθyé, koθyó, poδyé, poδyó], etc. which we have concluded would be represented in their underlying representations respectively as /mete + e, mete + o, koθe + e, koθe + o, pode + e, pode + o/, etc. Notice that rule (19) will stress these forms improperly; that is, it will stress the first vowel because the second vowel of the hiatus is nonlow and the first is nonhigh. To correct this situation we need a rule which will raise /e/ to |i| in certain syllabic environments before the main stress rule applies. To begin with /e/ cannot be raised before /i/ because of forms like [fléišin]. It also cannot be raised before /u/ because of forms like [λéuta]. Finally, forms like [raskleár] show that it is not raised before /a/. However, it does raise before midvowels which is shown respectively for both /e/ and /o/ by [koθyé] and [koθyó]. A rule which would emcompass the above facts is (22).

(22) Vowel Raising

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \end{bmatrix} \rightarrow [+\text{High}] \; / \; \underline{\quad} \; \begin{bmatrix} +\text{Syllabic} \\ -\text{High} \\ -\text{Low} \end{bmatrix}$$

If this rule is linearly ordered before (19) then stress would be correctly assigned since "i" is neither nonhigh or back. In addition to this rule, however, we need a rule to glide high vowels which are the output of it plus vowels from other sources.

Chart IXb

partyé	/parti + e/	'I divided'
partyóres	/parti + ores/	'You divided'
partyo	/parti + o/	'He divided'

This rule, the gliding rule, is obviously ordered after stress placement since those vowels which glide, in many cases, play a part in stress placement. In addition, it will be ordered before vowel lowering since many of the high vowels which glide (the front ones) would lower and thus not glide if the order were otherwise. A rule which will account for the vowel glide alternation is rule (23).

(23) Gliding Rule

$$\begin{bmatrix} -\text{CNS} \\ +\text{High} \end{bmatrix} \rightarrow [-\text{Syllabic}] \; / \; \begin{bmatrix} \underline{\quad} \\ -\text{Stress} \end{bmatrix} \; \text{V}$$

The main stress rule preceded by the vowel raising rule, then, accounts for the data. We illustrate the rules presented so far in example #7.

Example #7

/señale/	/parti+s/	/parti+mos/	/parti+o/	/mete+o/	Underlying Forms
NA	NA	NA	(applies vacuously)	|metio|	Vowel Raising (22)
|señále|	|pártis|	|partímos|	|partió|	|metió|	Main Stress Rule (19)
|señál|	NA	NA	NA	NA	Apocope (8)
NA	NA	NA	|partyó|	|metyó|	Gliding (23)
NA	|pártes|	NA	NA	NA	Vowel Lowering (21)
[señál]	[pártes]	[partímos]	[partyó]	[metyó]	(Other Rules) Final Phonetic Form

Starting with rule (6) we found there were groups of lexemes whose stress it did not account for. Revising rule (6) as we introduced these groups, we arrived at (19) which accounted for all of the data. This then represents one solution to the problem of determining stress in Aragonese. There is, however, another solution taking a different approach which intuitively feels more correct. It claims that stress is penultimate in Aragonese and that all exceptions to this generalization are apparent only and can be explained by a second dependent generalization. To begin with let us restate the main stress rule in the form it was given under (6), that is in its penultimate form.

(6) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; _____ \; (C_o V) \; C_o \#$

Secondly, to get a complete grasp of the second generalization let us return to Charts V through VII for a better look. Notice that at the meeting of two vowels (hiatus) if one is stressed it will be the one which is lower (the case for [salyé] < /sali+ e/ and [trakeár])and if they are equal in heighth then the more back vowel will be stressed (the case for [benyú] < /beni + u/ and [múito]) otherwise the stress is penultimate.

To account for this regularity of pattern we must postulate a subsidiary rule for stress called stress shift which will be ordered after the main stress rule, (6), and which will shift stress in hiatuses from the vowel stressed by (6) to the other vowel if the proper conditions are met.

(24) STRESS SHIFT: If two vowels are in hiatus and one is stressed, move the stress to the other vowel if that vowel is lower; however, if they are equal in heighth, move the stress if the other vowel is more back.[14]

SD: $$\overset{1}{\left[\begin{array}{c} +\text{Syllabic} \\ +\text{Stress} \\ \left\{\begin{array}{c}[-\text{Back}] \\ [+\text{High}] \\ [-\text{Low}]\end{array}\right\} \\ a \end{array}\right]_a} \quad \overset{2}{\left[\begin{array}{c} +\text{Syllabic} \\ -\text{Stress} \\ \left\{\begin{array}{c}[-\text{Back}] \\ [-\text{High}] \\ [+\text{Low}]\end{array}\right\} \\ a \end{array}\right]_a}$$

SC: 1 → [-Stress]
2 → [+Stress]

Notice that this rule explains all the irregular stress patterns exhibited in Charts V through VII. This is illustrated in example #8.

Example #8

/beniu/	/kanteis/	/saliores/	/muito/	/salie/	/raskleare/	Underlying Form
|benίu|	|kantéis|	|saliόres|	|muίto|	|salίe|	|raskleáre|	Main Stress (6)
|beniú|	NA	NA	|múito|	|salié|	NA	Stress Shift (24
NA	NA	NA	NA	NA	|raskleár|	Apocope (8)
[benyú]	[kantéis]	[salyóres]	[múito]	[salyé]	[raskleár]	Final Phonetic Form

The issue is this: we have two solutions which both can account for the data; however, only one can be incorporated in the final grammar. Therefore, we must choose one of them as preferable in some nonarbitrary way. Compared in isolation from the rest of the grammar, the one involving (19) (henceforth A) would appear to be simpler than the solution involving (6) and (24) (henceforth B). However, as is well known, rules of particular solutions cannot be strictly compared in isolation from the rest of the grammar since they enter into functional relationships with other rules. Hence, the simpler solution in isolation may cause grave complications in the other parts of the grammar that the other more complex solution would not cause. If the complexity that it causes is greater than the complexity between it and the other solution, then, it should not be preferred.

With the above in mind, let us consider the following forms in Chart Ia which are exceptions under both solutions.

Chart Xa

anθía	'gum'
aβaδía	'rectory'
baθía	'bread kneading-trough'
xuδía	'kidney bean'
lexía	'bleach'
tía	'aunt'
tría	'act of separating sheep after returning from the mountains'

farrería	'blacksmith's shop'
mesðía	'noon day'
baðía	'rectory'
buyería	'drove of oxen'
θeßaðío	'mixture of oats and barley'
fusío	'spindle of a loom'
sekío	'drought'
tío	'uncle'
río	'river'

This pattern is also found in verb forms in the conditional tense in all the dialects.

Chart Xb

treßaλaría	'I would work'
treßaλarías	'You would work'
treßaλaría	'He would work'
treßaλarían	'We would work'
treßaλaríats	'You (pl) would work'
treßaλarían	'They would work'
faßlarías	'You would speak'
faßlaría	'He would speak'
faßlarían	'They would speak'

Notice that in the above data there is a hiatus in each of the lexemes. In each case the first vowel of the hiatus is stressed, however, according to both of our solutions the second vowel should be stressed. A possible solution to this problem is to postulate a nonsyllabic segment in the underlying forms between the vowels of the above hiatuses. If this segment were deleted after stress placement, properly stressed phonetic forms would be generated. For example, if some nonsyllabic, C^4, were postulated in the underlying form of [faßlaría], i.e. /faßlar + i C^4a/ present during stress placement, i.e., |faßlarí C^4a| and then deleted, i.e., [faßlaría] the proper phonetic forms would be generated. It then remains to be seen exactly what the phonological form of C^4 is. It should be obvious that one could "invent" a segment that could be deleted under all circumstances. For example, we could postulate a uvular stop for the above lexemes and then delete it very easily since there are no uvular

stops in Aragonese. However, a linguistic theory ehich allowed the choice of a segment just because it was not present in the phonetic inventory would be undesireable and at the very best ad hoc since the number of choices would be quite extensive and the choice between them highly arbitrary. Instead we propose that the quality of this segment be selected in some nonarbitrary way. One highly plausible way that has been suggested would be to set up the constraint that this segment should fill in a phonological gap in the segmental patterning of Aragonese. That is, with respect to our situation, it should be a segment that is neutralized in the intervocalic environment but which is found phonetically in other environments. If the above constraint is accepted (See Kiparsky 1968b for more justification) and it should be since the alternative is an unconstrainable inventory of segments, then, the forms of ChartX will have to be considered as true exceptions since there are no segments in Aragonese which will satisfy the above constraint. That is, all underlying nonsyllabic segments are found phonetically in intervocalic position. The above conclusion that these forms should be treated as exceptions is further substantiated by the fact that they are not representative of a larger group. That is, the nonverbal forms of Chart Xa and the conditional tense endings of Chart Xb are to the best of my knowledge the only ones which exhibit this pattern. Therefore, what we have here is a small group of exceptional forms which must be treated accordingly. One treatment of these forms under solution A would involve marking them for stress in their lexical entries and, in addition, supplying them with the rule feature [-Rule (19)] so they would not undergo the main stress rule (See Lakoff 1970 for discussion of rule features). On the other hand, under solution B all that would be required would be the rule feature [-rule (24)] since the penultimate stress rule, (6), would stress them properly. That is these forms like all other forms would be stressed by the main stress rule. However, they would not be subject to the stress shift rule. The claim is, then, that these forms are not exceptions to the main stress rule but to a subsidiary stress rule. Since they all exhibit a penultimate stress pattern, this seems to be a reasonable claim. On the other hand, under solution A we marked all the forms for stress in their lexical entries. However, this does not seem reasonable in view of the fact that they all exhibit the same stress pattern, that is, by marking them for stress in their lexical forms, we are missing a generalization. To remedy this we would have

to postulate a second rule, rule "r", which would stress this small group of forms. There would be more involved to it than this, however, because we would have to insure that regularly stressed forms would not undergo this stress rule. The simplest way to do this would be to set up a minus next rule, rule "q", which would be ordered before rule "r" and then mark the forms of Chart X as [-rule q] in addition to marking them as [-rule (19)] as noted above. Thus all regular forms would undergo rule "q" and thus not undergo rule "r"; on the other hand, the forms of Chart X would not undergo "q" and thus would undergo "r" and be stressed properly. This treatment of these forms under solution A though more complex seems more reasonable than the first since it points out the exceptional status of these forms but, in addition, emphasizes their regularity in stress with respect to each other.

Comparing the two solutions with respect to the forms of Chart X, we can clearly see that solution B is preferable since it only involves one rule feature while A involves two rule features and two additional rules in the grammar. In addition, B claims that these forms are stressed regularly with respect to the main stress rule. This seems reasonable since they, like most other forms, are penultimately stressed; however, they are irregular with respect to the stress shift rule since the stress in a hiatus is normally found on the lower vowel. However, A makes these claims only in a very obscure way and only at the expense of additional framework. The above then seems to lend support to the intuitive feeling of the correctness of solution B.

When compared in isolation, A was clearly preferable over B, however, with the addition of the data in Chart X and the resultant explanations of it, B seems to be the one which should be preferred. Nevertheless, the situation is not as clear as it could be because one does not know exactly how to interpret rule (24) in terms of complexity. Stress shift, an historically well documented rule with a physical explanation behind the directionality of the shift in stress, cannot be stated simply within the notational framework of generative phonology as it is now set up. If it could be written simpler, B would decisively be preferable; however, even in view of the above, we can choose solution B because of the extra framework involved with A and particularly because of the use of the minus next rule which should be very costly in a grammar due to its arbitrary nature.

There is some additional but weaker evidence, historical and theoretical in content, which seems to vindicate our choice of solution B as the more correct one. To begin with let us assume position B for simplicity of exposition. With this in mind, consider the masculine past participles of Chart XI which appear to be exceptions to stress shift.

Chart XI

fuyíu	'escaped'
dormíu	'slept'
beníu	'come'
sentíu	'felt'
faθíu	'done'
kayíu	'fallen'
teníu	'had'
reðíu	'laughed'
biβíu	'drink'
saʎíu	'left'
treβaʎáu	'worked'
payáu	'paid'
kantáu	'sung'
tornáu	'returned'
sabéu	'known'

One might object to the stress shift rule on the basis that it violates some of the above data. On the surface this appears to be a valid objection because there does exist a group of lexemes in some of the dialects which do not undergo stress shift but which apparently do meet its structural description. Compare the above set of forms with a corresponding set from another dialect.

Chart XII

dormyú	'slept'
benyú	'come'
sentyú	'felt'
rompyú	'broken'
suβyú	'known'

This set of forms unlike the ones of Chart XI have undergone stress shift. A solution that suggests itself is that the first set of dialects lack the stress shift rule. However, forms like [sofráina, maδéiša, λéuta, peláire, pyáina, aβryé] from these dialects indicate that stress shift is also in their grammars. The question is then how do we account for the exceptional forms in these dialects if they cannot be accounted for on the grounds that stress shift is missing.

For a clearer view into the answer of this problem let us take a look at the morphological make-up of the past participle. Notice that morphophonemically the masculine form of the past participle in both sets of dialects will end in a two vowel sequence, the first vowel of the sequence being the stem vowel of the verb and the second appearing to be the phonological realization of the past participle and masculine gender morphemes. On the other hand the feminine form of the past participle ends in a consonant-vowel sequence which is immediately preceded by the stem vowel. The consonant-vowel sequence appears to be the phonological realization of the past participle and feminine gender morphemes.

Chart XIII

dormíδa	'slept'
benídδa	'come'
suβíδa	'known'
saβéδa	'known'
treβaλáδa	'worked'
sentídδa	'felt'
tornáδa	'returned'

It thus appears as if "u" and "da" are in morphemic alternation. On independent grounds "o ~ u" and "a" can be determined to be the phonetic realizations of the masculine and feminine gender morphemes respectively as Chart XIV shows.

Chart XIV

gwéso	'bone'	M
péĉo	'chest'	M
náso	'nose'	M
alagárto	'lizard'	M

ašáu	'bread gravy'	M
enronáu	'dirty'	M
kuñáu	'brother-in-law'	M
foráu	'headwound'	M
ká-a	'face'	F
bárβa	'tip of the chin'	F
kaβésa	'head'	F
kása	'house'	F
formíya	'ant'	F[16]

M=masculine F=feminine

If the "a" of "da" represents the feminine gender morpheme then "d" probably represents the past participle morpheme. On the other hand, the "u" of the masculine participle does not seem to be an analogous case because it alone appears to be representing the past participle and masculine gender morphemes. One possible solution to this anomaly is not to consider the "d" and "a" of "da" as participle and gender morphemes respectively but to treat "da" and "u" as portmonteau morphs, that is, they each represent two morphemes. They both would represent the participle morpheme and individually "da" the feminine gender morpheme and "u" the masculine gender morpheme. This would result in a morphological spelling rule approximating the following.

(25)

$$[+\text{Participle}] \rightarrow \left\{ \begin{array}{l} /da/ \;/\; \left[\underline{\quad\quad} \; +\text{Fem} \right] \\ /u/ \;/\; \left[\underline{\quad\quad} \; -\text{Fem} \right] \end{array} \right\}$$

The above rule, however, seems to be missing a generalization. The fact that "u (o)" usually represents the masculine gender affix and "a" usually represents the feminine gender affix is obscured by it. This rule, in fact, complicates the regular gender spelling rules because now they must be restricted so as not to apply to the participle forms.

A second solution not causing these complications would be to consider the final "a" (of "da") and "u" of the participle forms as the phonetic realizations of the feminine and masculine gender morphemes respectively. The gender spelling rules would then not be complicated (they would also apply to the participles). This would mean that the participle morpheme would have a null representation in masculine forms. A rule approximating this is rule (26).

(26)

$$[+\text{Participle}] \rightarrow \left\{ \begin{array}{l} \emptyset \ / \ \underline{\quad} \ [-\text{Fem}] \\ /d/ \ / \ \underline{\quad} \ [+\text{Fem}] \end{array} \right\}$$

The above rule, however, although capable of generating the past participles, does not alleviate our stress problem. That is, it does not contribute to an explanation of the placement of stress in the forms of Chart XI. In addition, there are other forms which are not participles in which a "d" is missing in the masculine forms, for example [kuñáða:kuñáu] ("sister-in-law:brother-in-law"). A solution which would handle forms such as these in addition to the stress problem would be preferable.

A third approach to the problem would be to consider that all past participle morphemes receive the same phonological spelling, that is, they are spelled as "d".

(27) [+Participle] → /d/

This rule is much simpler than rules (25) and (26) and like (26) it does not complicate the gender spelling rules. However, it requires the addition of a rule in the phonological component that is not required by rules (25) and (26). The explanatory value, if any, that this phonological rule can supply will determine if it is to be accepted into the grammar. Consider once again the participle forms of the first set of dialects. Examples of masculine and feminine forms are respectively [kantáu:kantaða, dormíu: dormíða], etc. Above we postulated a /d/ as the phonological realization of the participle morpheme. Thus "kantáu" and "dormíu" would respectively be in their underlying forms /kanta+ d+ u/ and /dormi+ d+ u/. A rule which would account for the loss of "d" in the masculine participle and thus for the canonical difference between it and the feminine participle would be consonant syncope.

(28) Consonant Syncope

$$\begin{bmatrix} +\text{CNS} \\ +\text{COR} \\ +\text{ANT} \\ -\text{CNT} \\ +\text{VCE} \end{bmatrix} \rightarrow \emptyset \ / \ [+\text{Stress}] \ \underline{\quad} \ \begin{bmatrix} +\text{Syllabic} \\ +\text{Back} \\ -\text{Low} \end{bmatrix}$$

This rule not only explains the absence of "d" before "u" in the participles but also in nonparticipial forms ([kuñáu, kuñáða]). More importantly, it explains why some of the participial forms are exceptions to stress shift. If rule (28), consonant syncope, is ordered after stress shift, rule (24), then the hiatuses formed by rule (28) cannot be subject to stress shift. Therefore, the stress would remain on the penultimate vowel.

Example #9

/kanta+d+u/	/dormi+d+u/	/dormi+d+a/	Underlying Form
|kantádu|	|dormídu|	|dormída|	Main Stress (6)
NA	NA	NA	Stress Shift (24)
|kantáu|	|dormíu|	NA	Consonant Syncope (28) (Other rules)
[kantáu]	[dormíu]	[dormíða]	Phonetic Form

The linear ordering of consonant syncope after stress shift then explains the exceptional behavior of the participles with respect to stress shift in the first set of dialects. Now consider the corresponding participles in the second set of dialects. From Chart Vb we have the forms [rompyú, suβyú, sentyú, benyú, kisyú]. In these forms the stress is on the final vowel of the underlying hiatus. It then appears that these hiatuses are subject to stress shift in this dialect as opposed to the other dialects where they are not. We can account for this very easily by assuming that rule (25), consonant syncope, is ordered before rule (24), stress shift, in this dialect. Thus these hiatuses are formed before stress shift applies and thus are subject to it. Using the same forms as in example #9, we illustrate this in example #10.

Example #10

/kanta+d+u/	/dormi+d+u/	/dormi+d+a/	Underlying Form
|kantádu|	|dormídu|	|dormída|	Penult Stress (6)
|kantáu|	|dormíu|	NA	Consonant Syncope (28)
NA	|dormiú|	NA	Stress Shift (24)
NA	|dormyú|	NA	Gliding (23) (Other rules)
[kantáu]	[dormyú]	[dormíða]	Final Phonetic Form

Here is then a case where two intimately related sets of dialects have the same rules but in a different linear order. Historically (according to Alvar-Lopez (1947, 1953)) the case was that for all dialects the stress in these constructions was on the penultimate vowel thus historically consonant syncope was ordered after stress shift.

Notice that the change in rule order makes stress shift more productive (that is, it applies to more forms). In fact a particular type of relationship has come about as a result of this reordering. The C-syncope rule now creates representations for stress shift to which otherwise stress shift would have been inapplicable. Following Kiparsky we term this relationship a Feeding Relationship and call the C-syncope rule a Feeding Rule relative to stress shift. Kiparsky besides labeling various functional rule relationships has, in addition, stated a well supported maxim by which rules will reorder which is "Rules tend to shift into the order which allows their fullest utilization in the grammar." (Kiparsky 1968a:200) The assumption is that rules do not reorder haphazardly but reorder according to this principle. It can easily be seen that this principle explains why C-syncope and stress shift have reordered in the one set of dialects, that is, the ordering of C-syncope before stress shift allows stress shift to be more fully utilized.

To account for the above participles in the second set of dialects (Chart IX) under solution A, that is, the solution which involved (19), we would have to order C-syncope before the main stress rule (19). On the other hand, to account for the participles in the first set of dialects, we would have to order C-syncope after the main stress rule. Therefore, the hiatuses formed by C-syncope would not be subject to the main stress rule. We stated earlier that the situation historically was that C-syncope was ordered after stress placement thus the stress was originally always on the penultimate vowel of those forms which undergo C-syncope. Notice though that the shift in linear order under solution A of the C-syncope rule from after the main stress rule to before the main stress rule does not mean that (19) is going to be more fully utilized. That is, the stress rule operates on just as many forms before the change as after. Certain subrules of the main stress rule do become more productive at the espense of others, but the stress rule itself is not more productive. This shifting of rules in the linear order is haphazard since there is no principle behind it.

It represents a strange anomaly in view of the fact that there are no known reorderings which cannot be explained by Kiparsky's principle. On the other hand, under solution B the reordering of C-syncope and stress shift is not anomaly but a perfectly explainable phenomenon under Kiparsky's principle. This provides some indirect evidence that our choice of solution B is the correct one.

In addition to the above, one might note that under solution A the statement of the C-syncope rule is different when it is ordered before (19) as in the second set of dialects than when it is ordered after (19) in the first set. That is, it will be stated as above (the same as under solution B) when it is ordered after the main stress rule; however, when it is ordered before the main stress rule it must be stated in a more complicated form. This results from the fact that in the rule we stated above we used stress as part of the structural description. This seems to be compatible with the facts since [d]'s do not undergo syncope before all nonlow back vowels but only those which immediately follow the stressed vowel. Therefore, when this rule is ordered before main stress in dialect E under solution A, it will somehow have to incorporate the fact that it is the [d] which follows the stressed vowel which is deleted. This can be done by incorporating the structural description of the penultimate subrule of (19) into the C-syncope rule.

$$d \rightarrow \emptyset \;/\; V \;___\; \begin{bmatrix} +\text{Syl} \\ +\text{Back} \\ -\text{Low} \end{bmatrix} \; C_o \; \#$$

However this is a more complicated rule than the one needed under solution B (rule (28) above) for the same dialect. Thus solution B provides a slightly simpler solution with respect to C-syncope in the dialects which have reordered. Therefore in this dialect we have even more evidence for the preferability of B; however, the solution is the same with respect to dialects B and D. This brings up another curious aspect of solution A, that is, why should the C-syncope have to be formulated differently when it is ordered after main stress when the results of it are identical. This is probably a result of the fact that C-syncope is reliant upon stress and that if it is ordered before stress we will have to incorporate into it the stress rule in some form. Solution B, then, with a main stress rule which would always precede C-syncope and a stress shift rule which would sometimes follow C-syncope would always express this fact.

The above evidence, both indirect (haphazard versus principled reordering) and direct (the simpler C-syncope rule under B as opposed to solution A, however, which is only good for the one set of dialects is hardly crushing evidence for the preferability of B to A, but it does help confirm the evidence presented earlier.

In summary, then, presented with two solutions to stress placement, one involving a single complex rule (A) and the other, two rules one simple and one complex (B), we had to choose between them. Compared in isolation from the rest of the grammar, the first solution appeared to be simpler; however, it was discovered after looking at other parts of the grammar that the first solution caused complications that the second did not and thus was not to be preferred. However, it must be admitted that this argument involving the exceptional forms that was presented to show the preferability of B to A is not as conclusive as one might desire in such a situation. That is, the difference in complexity between the two solutions with respect to the exceptional forms of Chart X is difficult to compare with the difference in complexity between the stress placement rules of the solutions themselves. This is due to the fact that the conditions placed on the stress shift rule are difficult to interpret in terms of simplicity (as it has been discussed in the li erature to date). It does seem, though, even with this that the simplicity caused by solution B with respect to the exceptional forms is greater than the differences between stress placement rules, and for this reason solution B will be preferred. In addition, we had indirect evidence which seemed to confirm our choice of B; however, this evidence cannot (and did not) bear directly on our decision.

2. At the beginning of this paper it was said that the purpose of the study was to establish that stress was regular in Aragonese. The most predominant stress pattern was found to be penultimate, however, there were many large groups of lexemes displaying other stress patterns. These groups constituted a mass of apparent exceptions to the penultimate stress rule. It was shown, though, after a closer inspection that these groups of lexemes (excepting one small group) did not constitute exceptions at all, but, in fact, were quite regular. So what at first appeared to be a very chaotic stress situation turned out to be very regular. However, it was found that two solutions were, in fact, applicable to the data, but after

research one appeared to be more preferable (though the evidence was not as conclusive as one might desire). Thus a penultimate stress rule[12] and a subsidiary stress rule of stress shift along with other independently motivated rules accounted for the various stress patterns in Aragonese.[13] In addition, what few differences that did exist between the dialects with respect to stress were shown to exist as a result of rule reordering.

NOTES

1. The theory of grammar within which this paper is written is usually referred to as the transformational model. A transformational grammar is composed of a central syntactic component and two interpretative components, the semantic and phonological. It is the latter component which we are specifically concerned with here. For a detailed treatment of the structure of phonological component in a transformational grammar see Chomsky and Halle 1968, Harms 1968, and Postal 1968.

2. Aragonese is spoken in the mountainous region of northeastern Spain. Bordered on the west by Castilian and on the east by Catalan, the speakers of Aragonese for centuries have been under constant pressure to accept features from these languages. Castilian has made extensive inroads into Aragonese generally along the western frontiers of Aragon but especially in the southwest. Catalan, on the other hand, has made small inroads in the eastern regions of Aragon.

3. This study is based mainly on the work of three men: Günther Haensch, Antonio Badía Margarit, and Manuel Alvar Lopez. All three men did not approach the study of Aragonese grammar from the point of view of theoretical of model grammar. Instead their works are in the main data collections. That is, they are long lists of lexemes and verb paradigms with sparse historical comments. Few, if any, conclusions are reached. This is not to say that their labor has not been fruitful since in effect a good data collection is useful for any linguist wishing to do further work on the language. However, even good data collections will have their limitations for a linguist who might want to do a more definitive study in some specific area, but this limitation would be found in all general studies, theoretical or nontheoretical. More primary research should be done in all areas

covered by this paper; however, it is doubtful whether it would radically modify the conclusions reached in it. The collections of data gathered by Günther Haensch and Antonio Badía Margarit respectively for the eastern and central areas of Aragonese are extremely well done and relatively complete. The data collection by Manuel Alvar Lopez for the western area though helpful is not well done and not complete at all.

4. Since this is not a study of data that was collected by the writer, but one of material that was collected previously by other writers, certain difficulties have been encountered. One that particularly needs to be pointed out is that certain gaps exist in the data and that these cannot be filled without further field work. This is particularly noticeable when one tries to find corresponding linguistic forms from dialect to dialect. Only in the rare cases are corresponding linguistic forms found documented in all five dialects. A documentation in two or three dialects for a particular form is more common.

5. The phonetic symbols used throughout this paper have the values usually associated with them by the International Phonetic Association. Those which differ or are not used by the Association are listed below.

ð	dental voiced fricative
ĉ	alveopalatal voiceless affricate
ĵ	alveopalatal voiced affricate
š	alveopalatal voiceless fricative
ž	alveopalatal voiced fricative
ñ	palatal nasal sonorant
λ	palatal lateral sonorant

6. This rule, if it is to account for monosyllabic words (not given above), will have to be elaborated. Since this is a minor modification, this will be done in a later version of the rule.

7. This does not exhaust the group of lexemes that have this pattern because in addition to many more substantives of this type, there are many examples of this type from the verb conjugations.

8. This is not to say that exception features do not have a place in transformational grammars but only that their use should be kept to a minimum. Sporadic exceptions do occur and should be pointed out; however, the lexemes of which the ones of Chart IV are representative are not sporadic and are relatively numerous.

9. The forms of Chart IV, however, are not completely regular. The fact that these substantives do not end in vowels intheir underlying forms means that they do not undergo the gender spelling rule. All lexical entries of this type would have to be marked [-Gender spelling]. Notice that this results in a simpler solution (the one we have presented) than if we were to assume that they did undergo gender spelling (which amounts to treating them as exceptions on the phonological level). If we assumed the latter, these entries would have to be marked [-Rule 6], but, in addition, another rule, an antepenultimate stress rule, would have to be written in order to stress them properly. This is not all though, because under the principles of transformational grammar each lexical entry is automatically [Rule n] for each n in the grammar. In order to block the antepenultimate stress rule from applying to the mass of regular forms (in the most economical way possible), we would have to postulate rule "q", q) [+Seg] → [-Next Rule], which would be ordered immediately before the antepenultimate stress rule. In addition, we would have to mark the forms of Chart IV as minus [-Rule q]. The mass of regular forms would then be excepted from the antepenultimate stress rule by rule "q", but the forms of Chart IV would be expected from "q" and thus would undergo the antepenultimate stress rule. A derivation for the above solution would look like the following:

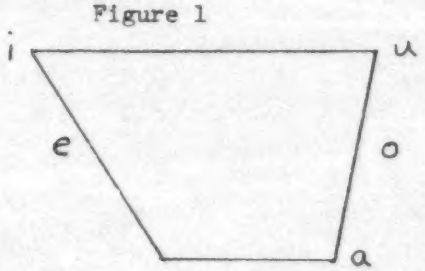
/mokadore/	/señale/	Underlying Forms
-Rule 6		
-Rule q		
NA	|señále|	6
NA	|señále|	q
|mokádore|	NA	Antepenultimate Stress rule
|mokádor|	|señál|	Apocope (8)
|mokáðor|	|señál|	Final Phonetic

It should be obvious that there is quite a bit more involved in this solution than the one we presented in the text; therefore, the solution of the text should be preferred.

10. At first sight one might think that stress shift is a strange rule. However, this is not the case at all. In fact, it is really a very natural rule that has a diachronic counterpart that is well documented historically in SW Romance.

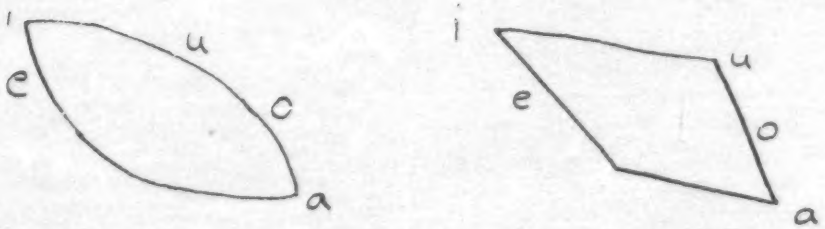
To begin with, some of the common vowel quadrangles do not represent the positions of the vowels in the mouth as accurately as we might think. Figure one is representative of these quandrangles.

Figure 1



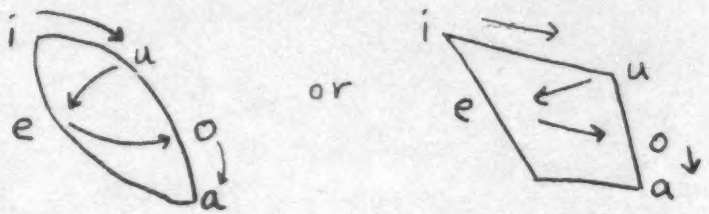
Notice that these quadrangles represent the front vowels and their corresponding back vowels, i.e. (i,u), (e,o), as being equal in heighth. However, this does not seem to be the case because the back vowels are usually slightly lower than their corresponding front counterparts. Figure two is more realistic drawing of the vowels in relationship to each other.

Figure 2



Notice that [u] is lower than [i] and [o] lower than [e]. The progression from the highest vowel to the lowest vowel would then be [i, u, e, o, a]. The case for stress shift both diachronically and synchronically is when [i] is in hiatus with either [u], [e], [o] or [a], and if stress is present, the latter will be stressed. If [u] is in hiatus with either [e], [o], or [a] and if stress is present, the latter will be stressed. If [e] is in hiatus with either [o] or [a] and if stress is present, the latter will be stressed. If [o] is in hiatus with [a] and if stress is present, then the latter will be stressed. We then have a shift in stress as portrayed in Figure three where the transitive relation ensues.

Figure 3



The stress then shifts from higher vowels to lower vowels and since [u] and [o] are respectively lower than [i] and [e], backness also entails being lower. The rule for stress shift is then simply: if two vowels are in hiatus and if one is stressed, move the stress to the other vowel if it is lower. Another interesting fact is that the number of cycles per second of the resonance frequency of the first formant of these vowels which has a rough correlation with vowel heighth directly corresponds with the direction of stress shift.

Figure 4

Approximate Resonance Frequency of Formant One

i	270	cps
u	300	cps
e	500	cps
o	550	cps
a	730	cps

In other words, all we have to say is that if two vowels are in hiatus and if one is stressed by (6), move the stress to the other vowel if that vowel has a higher frequency for formant one, i.e. if it is lower. It then appears that stress shift is in fact a very natural rule with a physical explanation for its directionality.

11. Before proceeding we can clear up the matter of the masculine gender morpheme. Consider some of the lexemes of Chart XIV once again.

Chart XIV

gwéso	'bone'
péĉo	'chest'
náso	'nose'
alagárto	'lizard'
ašáu	'bread gravy'
enronáu	'dirty'
kuñáu	'brother-in-law'
foráu	'headwound'

All of the above forms are masculine and the final vowel of each lexeme is the phonetic realization of the masculine gender morpheme. It is easily seen that there is an alternation between [u] and [o], that is, [u] occurs after syllabic segments, [o] occurs after nonsyllabic segments. The following forms help confirm this observation.

Chart XIVa

pekwáryo	'vetinarian'
pré yo	'especie of castigo'
sárryo	'cabamontes'
símyo	'dicese del trigo que lleva'
sírryo	'poca sutancia sirle'
nó yo	'sweetheart (male)'
matrimónyo	'marriage'
endámyo	'andamio'

To account for the above data we could assume that the masculine gender vowel is unmarked for highness and adjust the highness by a general rule which would have the highness agree with the syllabicity of the preceding segment. Rule (29) would be an approximation of this rule.

(29) Highness Adjustment Rule

$$\begin{bmatrix} +\text{Syllabic} \\ +\text{Back} \\ -\text{Low} \end{bmatrix} \rightarrow [\alpha\text{High}] \; / \; [\alpha\text{SYL}] ____ \; C_o \; \#$$

There are some forms, however, which do not seem to follow this pattern.

Chart XIVb

dormyú	'slept'
benyú	'come'
sentyú	'felt'
rompyú	'broken'

However, as was shown earlier in the discussion, the glides of the above forms must be considered to be syllabic in the underlying form. If we assume that the gliding rule, rule (23), is ordered after the highness adjustment rule, then the grammatical forms will be generated. That is, at the time of highness adjustment, the above lexemes will respectively look like |dormiŬ, beniŬ, sentiŬ|. The final nonlow vowel then will adjust to an underlying syllabic segment. Now consider the following forms which are representative of a large group of verbs.

Chart XIVc

metyó	'He put'
poδyó	'He was able'
partyó	'He divided'
salyó	'He left'

The glides of the above forms must also be considered syllabic in the underlying form. In addition, they must be considered syllabic at the time highness adjustment applies since they are glided at the same time the stem segments of Chart XIVb are. Under the solution we have proposed, the ungrammatical [metyú, poδyú, partyú, salyú] would be generated for the third person singular preterite forms. Notice however, as stated above, that these final vowels are not masculine gender vowels as the

rest are; that is, they represent the third person preterite singular. A possible solution, then, is to give the third person preterite singular morpheme a distinct phonological representation from the masculine gender morpheme. Since it only is realized as [o], let us assume that its phonological realization is /o/. If its representation is /o/ and if the masculine gender vowel must be distinct from it, the most obvious phonological representation for the masculine gender vowel is then /u/. Assuming this as our base, we can now make the following observations. That is, "u"s become "o"s after consonants but "o"s do not become "u"s after vowels. We should therefore limit rule (29) to the following.

(30) Highness Adjustment Rule

$$\begin{bmatrix} +\text{SYL} \\ \\ +\text{BACK} \end{bmatrix} \rightarrow [-\text{High}] \;/\; [-\text{Syllabic}] \;____\; C_o \;\#$$

This rule, in conjunction with the proper choice of underlying forms, then accounts for our data in a maximally simple way.

12. This may not exactly be true for all of Aragonese because in Eastern Aragonese there appears to be a group of verbs which take antepenultimate stress in the infinitives. For example [móure] from /mobe + re/, [déure] from /debe + re/, [pódre] from /pote + re/, etc. Since the group of verbs with this pattern is relatively small and is found only in Eastern Aragonese its existence will affect our overall solution for Aragonese very little. However, there seems to be two possible ways of handling these forms. One would be to let the main stress rule apply to them. This would result in a revised main stress rule for Eastern Aragonese. The second solution would be to handle them as exceptions to the main stress rule (6) and have them stressed by a subsidiary antepenultimate stress rule. More study, however, needs to be done before a decision can be made between these two approaches.

13. There is another group of apparent exceptions to our stress placement rules, however, that exists in eastern dialects. Consider the following chart.

Chart XV

ríus	'You laugh'
ríu	'He laughs'
reðíu	'You laugh (pl)'
ríure	'To laugh'
beníu	'You sell (pl)'
bíus	'You live'
bíu	'He lives'
biβíu	'You live (pl)'
bí re	'To live'
teníu	'You have (pl)'
dormíu	'You sleep (pl)'
beníu	'You come (pl)'
eskríure	'To write'
eskríus	'You write'
eskríu	'He writes'

The syllabicity of the underlined segments in words like "dormíu, kantáu, ríu, ríus, and bíure" appears to be that of a vowel. Spanish linguists represent this segment in phonetic notation as [u], however, we should not consider this representation as being as alternant of [w] as is sometimes done in the United States. The Spanish use both representations in their phonetic orthography. The latter representation, [w], is used for the nonsyllabic labiovelar semiconsonant which is similar to the initial segment of the English word wet [wet]. If [u] is not a semiconsonant then what is it? On structural grounds, these segments act like vowels since they are capable of taking stress. For example, historically "dormyú" came from "dormíu" in dialect E. In addition, as we have shown in the text, these segments in some of their instances seem to be playing an integral part in stress placement. Both pieces of evidence, historical and synchronic, then seem to indicate that the symbol [u] stands for a vowel like segment. Indeed the fact that they have vowel quality has been noted by Tomás Navarro, the Spanish phonetician who says that this type of segment "mantiene clarament su timbre vocálica de [u] más o menos cerrada." (Navarro 1966:62-63) My own acoustic investigations of the segments for which the symbols [i] (the front counterpart of [u]) and [u] have been used to represent also show that they are syllabic (=vocálico of Navarro) segments though very brief.

Notice that the stress has not shifted to the back vowel in the above hiatuses. As noted above stress shift appeats to be operative in all Aragonese dialects. Since the lexemes of Chart XV are representative of quite a large group of forms the use of exception features to prohibit them from undergoing stress shift would be quite expensive in terms of the simplicity metric. So expensive in fact that it might be more fruitful to drop the stress shift rule. This in turn would cause complications in the lexemes that do seem to undergo stress shift (they would now be exceptions to the main stress rule). If we are to hold on to the generalization of stress shift and at the same time not be belabored with an excessive amount of exception features, then we must find a systematic way to account for the lexemes of Chart XV. Towards this end let us consider the lexemes of Chart XVI.

Chart XVI

reðím	'We laugh'
reðíβa	'He was laughing'
reðíse	'He might laugh'
reðít	'laughed'
biβím	'We live'
bíβen	'They live'
biβít	'lived'
eskríβo	'I write'
eskriβím	'We write'
eskriβíu	'You write (pl)'

Now consider a complete paradigm of the verb 'move'.

Chart XVII

móβo	'I move'
móus	'You move'
móu	'He moves'
moβém	'We move'
moβéu	'You move (pl)'
móβen	'They move'
moβéβa	'He was moving'
móβa	'He may move'
moβét	'moved'
móure	'to move'

Without going into detail, it should be clear from the above charts that the stems which will account for the various related lexemes and their respective paradigms are going to have to contain a consonant, otherwise, all members of the respective paradigms cannot be accounted for. The underlying form of the stem, from which the lexemes of the paradigm of Chart XVII can best be derived, appears to be /mobe/. Two rules which will account for alternations in the stem such as "móu" and "moβém" are vowel apocopation which we discussed earlier and a new rule which I will call consonant vocalization. The underlying form of "móu" would be /mobe + ∅/ where the third person singular indicative has a null representation. Rule (8), the vowel apocopation rule, would apply to the phonological representation |móbe| and make it |mób|. This now brings us to our new rule, vocalization, which changes certain final and preconsonantal consonants into vowels. For the data we have given above, the following informal form of the rule will suffice.

(31) Consonant Vocalization

$$\left\{ \begin{matrix} d \\ b \end{matrix} \right\} \rightarrow u \; / \; \underline{\qquad} \left\{ \begin{matrix} \# \\ C \end{matrix} \right\}$$

This rule would then derive [móu] from |mób|. Since the "β" in "moβém" is intervocalic, it does not vocalize. Once an extension is made on our apocope rule to apocopate vowels also before final [s] all the above forms will be handled quite easily.

Example #11

/mobe+s/	/mobe+de/	/λešiu/	/ridi+∅/	/ridi+s/	/ridi+de/	Underlying Form
|móbes|	|mobéde|	|λešíu|	|rídi|	|rídis|	|ridíde|	Stress (6)
NA	NA	|λešiú|	NA	NA	NA	Stress Shift (24)
|móbs|	|mobéd|	NA	|ríd|	|ríds|	|ridíd|	Apocope (8)
|móus|	|mobéu|	NA	|ríu|	|ríus|	|ridíu|	Vocalization (31)
NA	NA	|λešyú|	NA	NA	NA	Gliding (23) (Other rules)
[móus]	[moβéu]	[λešyú]	[ríus]	[ríus]	[reðíu]	Final Phonetic Form

|móbe+s| by the extended apocope rule then will become |móbs| which by vocalization becomes [móus]. [mobéu] would derive from an underlying form like /mobe+de/ which after stress is |mobéde| then through apocope becomes |mobéd| and later by vocalization [mobéu]. The rest of the forms are derived in an analogous way. All the hiatuses of Chart XV then come into existence as a result of consonant vocalization. If we assume vocalization to be linearly ordered after stress shift then these hiatuses are not subject to it simply because they were nonexistent at the place in the grammar where stress shift operated. The linear order of stress shift and vocalization then explains the apparent exceptions to stress shift of Chart XV. We are thus able not only to hold on to our generalization of stress shift without burdening the grammar with exception features, but, in addition, add a new generalization of consonant vocalization to the grammar.

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